Division of Aging Biology (DAB)

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The official link for this solicitation is: http://grants.nih.gov/grants/guide/pa-files/PA-12-089.html

Agency:
Department of Health and Human Services

Release Date:
January 31, 2012
Branch:
n/a

Open Date:
January 31, 2012
Program / Phase / Year:
STTR / Phase I / 2012

Application Due Date:
January 08, 2013

Solicitation:
PA-12-089

Close Date:
January 08, 2013
Topic Number:
2.3

Description:

DAB sponsors research on the molecular, cellular, genetic, and physiological causes and consequences of aging processes. The ultimate goal is to develop interventions to reduce and/or delay age-related degenerative processes in humans. DAB also has responsibility for maintaining existing resources and developing new resources for aging research, such as populations of well-characterized animals and specific cell lines including, for example, human fetal lung fibroblasts.

DAB areas of research that may be of interest to small businesses include, but are not limited to:

A. Effects of metabolism on the aging process, e.g., how metabolic regulation influences longevity, and the development of anti-oxidants or other interventions to reduce oxidative stress and aging-related diseases.

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B. Development of minimally-perturbing techniques for collecting blood from mice, rats, and other animals several times a day in sufficient quantities for measurement of hormone levels and other

circulating factors in young and old animals, or development of non-invasive research and test methods for use in animals.

Dr. Nancy Nadon

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C. Development of molecular probes such as antibodies, DNA sequences and expression vectors useful in studying aging, senescence, and longevity both *in vivo* and *in vitro*.

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D. Development of new animal models, including transgenic animals, for studying aging processes, as well as development of new biological model systems for research on aging to replace or reduce vertebrate animal use in research. These models may include better *in vitro* systems, improved cell culture methods, mathematical models, and computer simulations.

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E. Development of interventions to slow down the degenerative processes associated with aging. These would include techniques with commercial potential to: (1) manipulate the control of cell proliferation or programmed cell death, (2) reduce the level of damage to nucleic acids, proteins and lipids and the macromolecular complexes formed from these molecules, (3) improve the damage surveillance and repair potential of cells, (4) improve the immune response to foreign molecules or reduce the response to self, and (5) reverse age-related changes in hormone production and function.

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F. Development of treatments for wound healing in the aged. These would include devices, processes, and pharmacological agents with the potential to (1) promote would healing in aged tissues such as

skin, muscle, cartilage, and bone, or (2) reduce scar formation without compromising effective healing. Wounds produced by accidental damage or resulting from surgery would be appropriate for consideration.

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G. Development of cell-based therapies or other treatments to repair myocardial or vascular tissues after ischemia. The work should include consideration of age-related effects on the therapy

or treatment.

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H. 1. Development of tools and technologies to characterize cellular heterogeneity in aging tissues
at the single cell level.

2. Development of interventional strategies to alter the senescence status of cells in tissues and organs of old animals.

3. Development of computational and bio statistical methods for systems biology approaches.

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I. Development of tools, methods, resources, biomarkers, and interventions in the areas of genetics, epigenetics, genomics, functional genomics, bioinformatics, computational biology, telomere, and DNA repair:

1. Development of tools and resources in genetics and genomics to study molecular mechanisms of normal aging or aging-related diseases.

2. Development of biomarkers for prognosis, diagnosis, or treatment monitoring of aging or aging-related diseases. Biomarkers of sufficient reliability, sensitivity and specificity are likely to be comprised of multiple physiological parameters, rather than a single molecular entity. Biomarker signatures may be composed of multiple genes, RNAs, microRNAs, proteins, or metabolites, or combinations thereof. Approaches using genomics, epigenomics, transcriptomics, proteomics, metabolomics, lipomics, glycomics, or other high throughput measurements are encouraged to develop such biomarkers or biomarker signatures.

3. Development of computational, statistical, or bioinformatics tools and resources to manage, integrate, and mine high throughput data obtained by genomic, functional genomic or other ‘omic” approaches.

4. Development of databases, methods for integration of databases, or data analysis systems for aging research.

5. Development of technologies, tools, methods, and resources useful for systems biology study of aging and aging-related diseases.

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